

DUNSTER (E.S.)

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PUERPERAL CONVULSIONS,

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PROFESSOR OF OBSTETRICS AND DISEASES OF WOMEN AND CHILDREN  
IN THE UNIVERSITY OF MICHIGAN.

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# THE PROPHYLAXIS OF PUERPERAL CONVULSIONS.<sup>1</sup>

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In the lying-in room there is perhaps no foe more dreaded by the obstetrician than puerperal convulsions. The great mortality resulting from this affection; its comparative frequency, especially in primiparae, and in a severe case the repulsive and violent character of the spasms, coupled too oft with a consciousness on the part of the attendant of his entire helplessness in the presence of such an enemy, all combine to make a scene of almost dramatic intensity of interest, that, once witnessed, can never be forgotten and is always to be dreaded. And yet there is much comfort in the fact, familiar to you all, that under the recent improvements in our art, the mortality from this unwelcome guest has diminished at least fifty per cent. during the last thirty years. If now art can be applied to the warding off of the condition or disease under consideration, still further good will result, not only in the saving of valuable lives, but also in the frequent prevention of one of the most distressing scenes ever witnessed in the lying-in room. Happily this can often be done and there is perhaps no more striking or assuring instance of the improvement in modern obstetric art than is seen in the knowledge we now possess of efficient measures for the prophylactic treatment of eclampsia. It is to this limited question alone that I ask your attention to-day, for in the time which you have so generously allotted in the invitation with which you have honored me, it would be impossible to discuss the whole subject. Furthermore, I have a very decided impression that as a rule the profession are not as familiar with this portion of the subject as they are with the immediate and appropriate treatment of a case where the convulsions have already supervened; and it seems to me that our time will be well spent in considering a subject of such large practical importance as that of the prevention of eclampsia. In the future of medicine

<sup>1</sup> Read before the Southern Michigan Medical Association, July 9, 1878.

the prevention of disease is clearly destined to assume a steadily increasing importance, and it is, perhaps, not too much to assert that the time will yet come in which prevention, rather than the cure of disease, will constitute the main work of the physician.

Before entering, however, upon the discussion even of this limited question, it is necessary to allude to the pathogeny of the condition under consideration; for without such knowledge we can neither clearly understand nor intelligently apply the treatment to be recommended. The first positive step in advance on this question was made in 1843, when Lever\* pointed out the frequent and almost constant connection between puerperal convulsions and albuminuria.—From that time the study of the urine in the pregnant and puerperal states attracted the closest attention and scrutiny; and while no one supposed that the mere presence of albumen in the urine was the cause of the convulsions, it soon led to the uremic theory, so called; for, as is well known, where albumen is found in any quantity in the urine, there is a corresponding deficiency of urea. The inference then was easy, indeed it was natural, that the retention of the urea in the blood was the prime cause of convulsion and hence these cases were assumed to be similar in their pathological condition to what was already known to exist in some of the chronic forms of Bright's disease, where patients die in coma and convulsion of the kind usually recognized as uremic. This view was adopted by Braun, of Vienna, and the influence of his deservedly great name caused its acceptance by a large share of the profession. The celebrated physiologist, Frerichs, at about the same time, began an experimental investigation into the condition of the urine and blood in eclamptic patients. He asserted that urea, as such, was not found in any quantity in the blood, but that it had been converted by the addition of water, under the influence of some ferment in the blood, into carbonate of ammonia,† and by injecting this substance into the veins of the lower animals, he produced convulsions of a character similar to those observed in eclampsia. This theory rapidly gained ground and was in turn accepted by Braun and many of the leading obstetricians of the day, as competent and in all respects satisfactory to account for the condition. The physiologists and pathologists, however, did not yield so ready an assent, and many experiments—notably those of Oppler in Germany and Hammond‡ in our own country—were made, which showed not only that carbonate of ammonia is not found in the blood, but that this sub-

\* *Guy's Hospital Reports*, Second Series, Vol. I.—1843.

†  $(\text{C H}_4 \text{ N}_2 \text{ O})$  plus  $2 \text{ H O} = (\text{N H}_4) 2 \text{ C O}_3$ . Urea plus Water — Ammon. Carb.

‡ *American Journal Med. Sciences*, Jan. 1861.



stance, as well as urea, might be injected into the blood in considerable quantity, provided only that the injection be made very slowly; a sudden injection of almost any substance, even serum, will produce convulsion. Notwithstanding this direct and experimental contradiction of Frerichs' theory, his views slowly gained ground. Braun held further that the albumen appeared in the urine in consequence of inflammation of the parenchyma of the kidneys, (Bright's disease) and where after death few or no traces, (as is often the case), of inflammation or change in structure were found, he asserted it was because of the very acute nature of the inflammation, which afforded no time for causing structural changes. Frerichs, however, it should be said, did not hold absolutely to the inflammatory theory, but he did assert most positively the association of albuminuria and convulsion, even going so far as to say—"no albumen, no eclampsia"—an assertion which clinical experience soon showed was untenable.

In justice to these views it should be said that Spiegelberg,\* of Breslau, has recently re-asserted them and brought forward new experimental evidence in their support. Under his instructions, Dr. Gescheidlen made most rigorous analyses of the blood and urine, which gave an excess of ammonia and an increase of urea in the blood, with a corresponding deficiency of urea in the urine. He furthermore experimented with dogs and rabbits with carbonate of ammonia and produced states analogous to those of uremia, *viz*: restlessness, tonic and clonic convulsions and finally deep coma.

In the midst of these conflicting theories, which alternately swayed the profession now this way and now that, careful clinical observation established the fact that there were three distinct classes of cases which clearly showed that the toxemic theory was too exclusive, or the conditions of blood poisoning and convulsion did not always stand to each other as cause and effect. These classes are—

1st. Those in which there are no evidences of any kidney lesion during life—nor any lesion itself after death, and yet the patient has eclampsia.

2d. Those in which the evidences of the lesion do exist and yet there are no convulsions.

3d. Those in which the evidences of the lesion appear only after the coming on of the convulsions.†

These groups are so widely different that they naturally suggest the

\* *Archiv. f. Gynäkol.*, 1870. Bd. 1, Hf. 1, S. 383. An abstract of this paper may be found in the *Lancet* of Dec. 10, 1870.

† Dr. J. Braxton Hicks, of Guy's Hospital, London, has published a most excellent paper on this class of cases. It is printed in the *Transactions of the Obstetrical Society of London*, Vol. VII.

enquiry whether, after all, there may not be some common cause for both the albuminuria and the convulsion. Several of the more recent theories would seem to answer, in a measure at least, to this conception of the case. Prominent among them is Traube's theory—first put forward to account for convulsions in general and adopted and specialized by Rosenstein with reference to puerperal convulsions. Hence it is generally spoken of as the Traube-Rosenstein theory. Briefly it is as follows. In pregnancy there is a watery condition of the blood with increased arterial tension, partly from this simple fact alone, and partly from the physiological hypertrophy of the heart, as well as the increased amount of the circulating fluid. The muscular straining at the onset of labor aggravates this arterial tension, and if the blood be still further hydremic by reason of degenerative changes in the kidney, we have just the conditions for an attack of eclampsia. For the hydremic blood by increased pressure produces an effusion through the walls of the capillaries of the brain, resulting in oedema and consequent anemia. If this be confined to the peripheral portions of the cerebrum, coma follows, but if the central portion, *i. e.* the motor centres, be involved, we have convulsion, as Kussmaul and Tenner\* long since demonstrated that anemia in these centres produces general convulsions. It is outside of my purpose in this paper to weigh the arguments for or against any of the theories put forward to account for the causation of puerperal convulsions. No one theory has yet been adduced which is perfectly satisfactory, and objections will suggest themselves to every thoughtful student of this subject. But, in passing, I may say that, in common with most obstetricians of to-day, I entertain the opinion that this theory is, on the whole, more rational and satisfactory than the pure toxemic theories; that it will account for a very large share of the cases occurring in practice; that it explains very satisfactorily why the occurrence of labor intensifies and aggravates the convulsions, and that it squares exactly with the results obtained from treatment directed to a diminution of blood pressure and hydremia, notably by blood-letting and the use of the arterial sedatives. And yet, I confess to some hesitation in expressing this opinion, when so distinguished an authority as Spiegelberg—who, it must be remembered, is an advocate of the toxemic theory—declares† that this theory of Traube and Rosenstein is but a “visionary hypothesis.” Supplementing it, however, by the theory of arterial spasm from uterine irritation, (Cohen's theory, next to be alluded to) and

\* On the Nature and Origin of Epileptiform Convulsions caused by profuse Bleeding and also those of true Epilepsy. *New Sydenham Society Publications*, 1859, Chap. VII.

† *Transactions American Gynecological Society*, Vol. II, p. 163.



keeping in mind always the peculiarly excitable condition of the nervous system in puerperal women, which Tyler Smith long ago pointed out as one of the predisposing causes of albuminuria and eclampsia, it seems to me we have a rational explanation of the occurrence of eclampsia in each of the three groups indicated above and that the pathogenesis of eclampsia thus suggested may be received at all events as tentative, and until, in the light of increasing knowledge, some more reasonable and satisfactory hypothesis shall be adduced.

Cohen's theory,\* alluded to above, is in brief as follows. He divides eclampsia into two kinds, uterine and cerebral. In the first the irritation is in the uterus and ascends, as it were, centripetally to the brain. In the second the irritation is from purely cerebral causes and descends centrifugally to the uterus. In both the varieties the essential nature of the eclampsia is a result of an irritated sympathetic nervous system. This irritation of the vaso-motor nerves produces a systole of the arterioles of the brain, with in turn cerebral anemia. He holds that the irritation of the lower segment of the uterus by the descent of the fetus into it at about the sixth month is competent to set in motion this train of influences, which at the coming on of labor will be enormously aggravated, and so we can easily account for the first group of cases, where there are no evidences of any kidney lesion, either before or after death. In this connection it should be said that Frankenhauser, of Jena, by a series of most careful dissections, has demonstrated a direct connection between the nerves of the uterus and the renal ganglia, thus affording an anatomical basis for the theory of the sympathetic relation between these two organs and accounting readily for the propagation of any irritation in either to the great nerve centers. Such an irritation in the uterus from pressure of the head of the fetus or manipulations by the hand of the accoucheur or from contraction of the walls of the uterus itself will excite ganglionic action, and this, reflected to the posterior brain, will produce the motor disturbances.

We may sum up the whole matter, then, by saying that in the present state of science, while the clinical association of convulsions with albuminuria, hydremia, anemia, uremia and primiparity, and possibly also with atmospheric influences, as was claimed by many of the older writers and admitted by Barker† and Spiegelberg,‡ is well understood, the causal relations of these conditions to convulsions must be held somewhat in abeyance.

\* *Archiv. f. Gynakol.*, Bd. VII., H. 1, S. 107.

† *The Puerperal Diseases*, New York, 1874, p. 112. ‡ *Loco citato*, p. 165.

There is a middle ground, as it were, between the toxemic and the mechanical theories, which takes cognizance of and gives importance to an additional factor, which is to be found in the more or less excitable condition of each patient herself, and it seems to me that keeping this condition steadily in view, we can more safely rest our beliefs upon the mechanical theory of Traube and Rosenstein than any yet propounded. Whatever theory we may adopt, it is essential for the proper conduct of the treatment that we never lose sight of the important pathological lesions which are usually met with, viz: the loss of albumen, resulting in hydremia and innutrition; anemia and œdema of the brain so marked at times as to produce flattening of the convolutions, and in the kidneys every possible condition, from no change whatever up through the slightest traces of congestion to the severest and most destructive forms of parenchymatous nephritis.

Leaving now the discussion of the pathogeny, we turn to a description of the prodromic signs and symptoms of the affection, which are the signals warning us of danger and which are the warrant for putting in to practice the prophylactic treatment. Too much attention cannot be given to the close observation and recognition of these symptoms. They are by no means uniformly present and even when they are well developed, they are too frequently overlooked or misinterpreted by the physician, whose teachings in the lecture room down to at least a very recent day, did not include this most important subject; for our present knowledge of it dates back but a comparatively few years.

Inasmuch then as the presence of albumen in the urine is one of the most constant as well as significant of the signs of the general condition which, by common consent, is included under the term puerperal albuminuria, it is needless to say that the urine should be carefully examined every few weeks during the last few months of gestation. In primiparæ especially this is of importance, but it is bad practice to limit such examination to this class of patients. This rule should be imperative for every pregnant woman and the sooner our students are trained to make this a routine practice, the better will be our results. The symptoms and signs rarely manifest themselves prior to six months and as a rule we shall be safe in postponing urine analysis until that time, but if a single one of the symptoms to be described comes on earlier, it necessitates a careful examination of the urine. This examination should be something more than a search for albumen. The mere presence of this substance is not of necessity an evidence of danger, but the amount of it is a matter of importance and the microscope



should be brought into play to ascertain what, if any, degree of structural lesion of the kidney—as indicated by the presence of casts, epithelial or hyaline, and blood corpuscles or debris—has already taken place. Even if such evidences are present, we are not to be discouraged, for it is astonishing at times to see permanent recovery, even where serious lesion of the tubes is clearly evident. I myself have witnessed cases of this sort and the popular belief that when once degeneration of this important viscus has begun, the case is of necessity hopeless, must be abandoned in the light of our present knowledge.

The prodromic symptoms of albuminuria may easily be grouped together and referred to the nervous, vascular and digestive systems. First on the list and perhaps the most frequent, and certainly of great importance, is headache. It is severe and acute in character, usually referred to the forehead, sometimes confined to one side—hemicrania—and the pain is often of a boring or lancinating character; occasionally it will be occipital and although generally intermittent at first, it may become continuous, when it will usually be dull and heavy. Persistent headache of any sort, frontal, occipital or hemicranial, should always be considered a suspicious symptom in a pregnant woman and should at once direct attention to the condition of the kidneys. Next on the list and also referable to the nervous system, are disturbances of the special senses, sight and hearing. These are of varied kinds; dimness or cloudiness of vision; floating specks or cobwebs; and blurred condition of small objects, like printed letters; then, too, at times there are flashes of light or clouds of darkness; double vision; inability to see a small object by looking directly at it. Complete loss of sight is rare, except during the period of active convulsions, but no matter what the visual disturbance is, no matter whether it be persistent or intermittent, which last is usually the case, interrogate at once the kidney. It is of no use as a rule to spend time and money in the expert use of the ophthalmoscope, expecting to find the trouble in the eye; for it is usually not there, unless the disease has progressed so far as to bring about albuminuric retinitis. I do not wish to be understood as underestimating in any degree the value of the ophthalmoscope or the evidence obtained by it. All I desire is to impress upon the minds, particularly of young physicians, the fact and emphasize it as sharply as possible, that in pregnancy visual disturbances of any sort as a rule are secondary reflex nervous phenomena, the primal cause of which must be looked for in impairment of the renal function, either with or without structural lesion. All of this is equally true of disturbances of the special sense, hearing. They are



not so varied or frequent, but careful questioning should always be made in this direction. Ringing in the ears, or roaring, noises like the hum of insects or the whirr of machinery, transient deafness—any departure, no matter what, from the healthy standard of this sense, should attract attention, and here also, conceding always the high value of the otoscope and of examination of the external ear, we can confidently say it is better at the outset to examine the urine, leaving the aural inspection for afterwork, in case no trouble be found in the kidney. We are on the safer and surer track in the majority of cases by searching in the direction of the kidney, rather than the ear.

Next I mention, as one of the symptoms of the digestive disturbances, pain or oppression in the epigastrium. This is enumerated by Chaussier as a symptom of great value, though of less frequency than the two already mentioned. When the pain is severe and of several hours continuous duration, it is especially significant. It may be accompanied with nausea, with or without vomiting, or this last may be present without the former. It is well known to you all that nausea, especially in the early morning or with the stomach empty, is one of the earliest symptoms of Bright's disease and it must be borne in mind that in albuminuria we have, in the majority of cases, the initial stage—congestion—of this disease. Loss of appetite, at all events transient, will usually be elicited on careful enquiry; the gastric irritability is sometimes accompanied with obstinate constipation, less frequently by diarrhea. There is great danger of misinterpreting these gastric symptoms, for in some form or other they are so nearly universal, that they are enumerated among the ordinary symptoms of pregnancy. When, however, we find them associated with any of the symptoms just mentioned, or whenever with them we find marked nervous irritability or insomnia, or whenever without such associations they are of themselves persistent, again it should be our rule to interrogate the kidney. In the light of the information which such an examination gives as to the nature of the excretive processes going on in the body, no physician can afford to deprive himself of this knowledge.

Finally, among the prodromic signs is œdema, though it stands at the head of the list in value. The œdema of albuminuria, however, must always be differentiated from the simple and ordinary œdema due to pressure of the gravid uterus on the great veins passing up over the brim of the pelvis. This last is so common that women themselves attach no significance to it and the physician from carelessness may also mistake a renal œdema for this simple form. By preference the œdema of albuminuria attacks the face and upper extremities first, the

œdema from pressure always manifests itself first in the ankles and legs. This last is always worse at night after the patient has been on her feet all day and it is more or less relieved by rest in the recumbent position, while the œdema from the renal lesion is apt to be more marked in the morning or after a long rest in the horizontal position. Furthermore, in a case of long standing or where the condition is well advanced, there is a peculiar appearance, difficult to describe, yet never forgotten after it has once been witnessed. The skin is of a dirty semi-transparent sort of tinge: sometimes there is a waxy appearance of the face, verging on a yellowish green color—not exactly that of chlorosis—but it seems almost as if one could see down into the tissues; the puffiness gives a look of dullness or hebetude, which is sometimes quite expressive: then the pasty appearance and the pitting on pressure are also significant. Nothing of this is found in the simple œdema of pregnancy—though precisely the same manifestations are seen in organic disease. All doubt, however, can be easily removed by following the simple rule—that in all cases of œdema during pregnancy the urine should be carefully analyzed. In closing this branch of our subject it must be remembered that the signs and symptoms just described are by no means uniformly present, and that they differ very largely as to the degree of their development in different subjects. We should, however, in all cases of pregnancy have our patients under observation during at least the last three months of gestation and we should instruct them as to the importance of acquainting us at once of the existence of any of such signs or symptoms.

Turning now to the consideration of the practical question of treatment and restricting ourselves as intimated to the preventive treatment alone, no matter what special therapeutic measures we may resort to, it is easy to group them all under certain well defined indications. By keeping these general principles of treatment clearly before us we can safely leave to the individual judgment or preference the selection of the means for meeting the indication. And first, we must not forget that in the large majority of cases albumen is present in the urine by reason of the congestion of the kidney and that the loss of albumen impoverishes the blood just in proportion to the amount of that substance drained away. Our indications then are\*

- 1st. To relieve the congestion of the kidneys.

\*In my class teaching I have adopted this general schedule of treatment from my distinguished friend and former instructor, Prof. Fordyce Barker, of New York. His admirable work on *The Puerperal Diseases*, almost the only one accessible in the English language, ought to be in the hands of every practicing obstetrician.

2nd. To counteract the impoverished state of the blood resulting from the loss of albumen.

3rd. To quiet the nervous and digestive disturbances and, failing all,

4th. To induce premature labor.

*First. Relieve the Congestion of the Kidneys.*—In the general treatment of congestion rest is an essential element and a congested kidney is no exception to this rule. We must give it rest. Fortunately this can be done, for the intestinal canal and the skin will vicariously do the work of the kidneys without difficulty. Purgation by hydragogues which only take away the watery portions of the blood and do not diminish the corpuscles, and diaphoresis are therefore the remedial agents to be relied on. The salines especially are indicated under the first division and they should be given so as to produce several watery discharges daily. Bitartrate of potash, compound jalap powder, citrate of magnesia, and sulphate of magnesia acidulated with sulphuric acid, may be mentioned. The natural mineral waters, Kissingen, Hunyadi or Pullna, or our own Saratoga waters are both pleasant and efficacious and they can now be easily obtained almost anywhere. Diaphoresis may be promoted by the vapor or hot air bath, which needs no especial apparatus, but can be easily improvised at any time or place. The Turkish bath, if accessible, is recommended by some authorities. As to the use of diuretics we must be cautious. If used at all the non-stimulating varieties such as the Vichy or Selters waters, acetate or citrate of potash, should be selected and their action may be supplemented by infusion of digitalis in short courses only. The alcoholic preparations of digitalis do not possess the diuretic properties of the infusion. The copious use of simple diluents to wash out the cylindrical clots from the tubules of Bellini will often suffice, provided the secretion from the Malpighian bodies be free, but if it be scanty, the mineral laxative waters will best serve the purpose. The Vichy and Selters waters are not only well borne in almost any condition of the kidney—but they are usually very grateful to the patient. Cupping, either dry or wet, over the kidney is also of value, particularly when there is pain or tenderness in that region and when the urine is scanty in quantity or smoky in color. If there is a hard bounding pulse, with severe pains in the head, flushed and hot skin, etc., indicating marked arterial tension, it will be best to reduce this promptly by venesection, though there is little doubt but that in most cases the free use of the saline laxatives will overcome these symptoms. As to the amount of blood to be drawn the severity of the symptoms and the



impression made upon them must be the guide rather than a positive statement as to the number of ounces to be abstracted. In a severe case the subsequent treatment will be facilitated by this sudden subjection of the arterial tension, which seems to interfere with the appropriate action of remedies.

The skin must under all circumstances be kept exceptionally active. Many of the laxative and diuretic remedies above mentioned have a concomitant diaphoretic effect, but we must not trust to this, but must insist on some form of the bath, followed by brisk friction, my experience being that the hot vapor is better borne than the hot water. In the œdema of Bright's disease I have used in two instances the *apocynum cannabinum* with admirable effect but have never bethought myself to employ it in the œdema of albuminuria. The new remedy, jaborandi, or its active principle, pilocarpine, by its wonderful diaphoretic power, promises most admirable results and already I have noted a number of cases reported in the journals of its successful use in the incipient stages of Bright's kidney, but as yet have personally had no opportunity to try it in the œdema of albuminuria in pregnancy.

*Second. Counteract the impoverished state of the blood resulting from the loss of albumen.* Good nutritious food, fresh air, an appropriate mode of life with proper tonics will best meet this indication. It is not long since we were taught by some masters that the nitrogenised foods should not be allowed, for it is out of these that albumen is principally made. This advice seems to me essentially contradictory to the established principles of physiology, for if the system is steadily losing this nutritious substance, we ought rather to afford the material for renewing it. If however we force the highly nitrogenised foods, like meats, there is a concealed danger in disturbance of the digestion, to which, as we have seen, there is already a tendency. At any rate, in almost all cases the white meats and fish are well borne. Milk, too, should be made a prominent article of diet and in severe cases the absolute milk diet has proved of great value. Tarnier\* and other authorities in Europe, as well as many of the profession in this country, have reported cases giving most satisfactory results where this plan has been enforced. It requires, however, a high degree of courage and a most determined will on the part of the patient to thoroughly carry out this plan. It is quite unnecessary to insist upon fresh and pure air and a thoroughly hygienic mode of life, for their influence in promoting a healthy condition of the system is evident to everybody. All of this might with propriety be included under the general head of tonic

\**Annales de Gynaecologie*, Janvier, 1876.

treatment, but we must specify one special tonic—on account of its pre-eminent value in this class of cases. It is the tincture of the chloride of iron. Barker\* and Playfair† both say without reservation that it is the best preparation for meeting this indication and almost all authorities place a very high estimate upon it. My own experience fully accords with that of Barker and Playfair just referred to. It has a double action, improving directly the condition of the blood and also acting as a diuretic. It should always be given very largely diluted and my impression is that much smaller doses than are usually recommended are the best. When iron is given to the extent of blackening the feces, we not only are wasting our iron but running the risk of deranging the digestive processes. In order to prevent the decomposition of urea in the blood, Frerichs recommended the free use of tartaric and benzoic acids or lemon juice. I have no experience except with the second of these remedies and that is not such as to give me any confidence in its value.

*Third. Quiet the nervous and digestive disturbances.* Recognizing the fact that in almost all cases there is marked nervous irritability, great care should be taken to free the patient from all sources of excitement, both mental and bodily. Mental depression from the situation or circumstances of the patient is something that the physician cannot reach and yet it is a fruitful source of mischief. It is most strikingly seen in young unmarried women, in whom remorse and shame at their condition will sometimes induce a state closely bordering on insanity. Insomnia is a prominent condition and one that is overcome with difficulty. The complete regulation of the habits and mode of life will do much to correct it, and an out-of-door life should be enjoined, being careful always that neither exercise nor work be carried to the extent of fatigue. Constant and cheerful occupation, however, for both mind and body is essential. The nervous sedatives may be employed, but opiates are to be avoided; soporifics that are non-constipating, like hydrate of chloral, may be resorted to in extreme cases that will not yield to the milder remedies. The bromide of potassium and the monobromide of camphor are of service. When a patient is brought well under the influence of these remedies, they seem not only to ameliorate the present condition but to give a considerable degree of immunity against convulsions at the time of labor. As to the digestive disturbances they are to be combated by the means appropriate to this purpose in other than the albuminuric condition. The worst features are, perhaps, constipation and consequent loss of appetite

\**Loco citato*, p. 81.

†*Treatise on the Science and Practice of Midwifery*. Am. Ed. p. 184.

and these are, fortunately, often overcome by the measures already noted as necessary to meet the first indication. Beside these however, pepsine, bismuth, nux vomica and the like substances will be found serviceable in many cases.

*Fourth. Failing all, induce premature labor.* There is a growing tendency, it seems to me, not only to a too hasty resort to this procedure, but to its employment in cases where it is not really necessary. Advocated originally by Braun some twenty years ago as a legitimate sequence of his theory as to the etiology of eclampsia, and sustained by the great weight of his and other authorities, it has been encouraged by a frequent clinical experience of cases in which the convulsions cease immediately or soon after delivery. Whatever may be the relation of the pregnant condition to the general state we call albuminuria, the fact that this morbid process so frequently begins to better immediately upon delivery, has undoubtedly led to a too exclusive reliance upon it. And yet I would in no way underestimate its importance in appropriate cases. In this connection, a reference to several recent authorities may not be out of place. Spiegelberg\* says: "The induction of premature labor, recommended by some, is not called for, because the supervention of spasms is not certain and because the induction of labor may in itself evoke them. The albuminuria and its underlying cause, as well as its sequelæ may, at any rate, justify intervention; the indications then are quite different." He further says in the second volume of his great work† just published: "In its outbreak during pregnancy, an obstetrical treatment, especially the induction of premature labor, cannot be entertained." Barker‡ says: "I have no hesitation, whenever the symptoms from albuminuria are of so grave a character that there is every probability that their continuance will result in the death of the mother, in advising and urging that labor should be brought on. \* \* \* The question is a much more difficult one when it turns upon the propriety of the measure solely for the purpose of saving the life of the child. But even in this case, if there be a probability of accomplishing such a result, I hold it to be a duty." The same author, in the current number of the *Am. Jour. Obstetrics*, [July, 1878], has an article on this particular subject, the general tenor of which is to caution against too frequent and too hasty a resort to this mode of interference. He closes as follows: "I trust no one will draw the conclusion, from what I have written above,

\**Loco citato*, p. 168.

†*Lehrbuch der Geburtshülfe*, p. 503. Quoted by Barker, *Am. Journal Obstetrics*, July 1868, p. 459.

‡*Puerperal Diseases*, p. 81.



that I do not regard the induction of premature labor as ever a justifiable measure. On the contrary, I deem it an imperative duty to resort to this operation when treatment has been thoroughly and perseveringly tried, without success, for the removal of symptoms of so grave a character that there is a strong probability that their continuance would result in the death of the patient." Dr. Angus Macdonald, a most careful observer as well as an acute reasoner, in an article\* on the general subject of *Albuminuria and Puerperal Eclampsia*, based upon nine cases in his own practice, says: "I have very great doubts regarding the propriety of ever inducing premature labor with the view of arresting eclamptic convulsions; because we then introduce a fresh source of reflex irritation, which I believe able in itself to induce such convulsions in certain temperaments. I would therefore recommend the restriction of obstetrical interference to cases where labor was already present, and where there was no great difficulty in dilating the soft parts so as to admit of delivery by forceps or turning, without risk to the mother." Playfair† says: "I believe that, having in view the undoubted risks which attend this complication (albuminuria), the operation (induction of premature labor) is unquestionably indicated and is perfectly justifiable in all cases attended with symptoms of gravity. It is not easy to lay down any definite rules to guide our decision; but I should not hesitate to adopt this resource in all cases in which the amount of albumen is considerable and progressively increasing, in which treatment has failed to lessen the amount: and above all, in every case attended with threatening symptoms, such as severe headache, dizziness or loss of sight." Leishman‡ accords in his opinion with Braun, that "labor should only be provoked when the symptoms are such that the life of the woman is in danger." Tarnier formerly recommended that it should be done before the symptoms became urgent, but in the last edition of Cazeaux's Midwifery, of which he is now the editor, he is much more reserved in his recommendation and says that "it may be of service in exceptional cases."

It were an easy task to multiply these quotations to almost any extent, but enough have been adduced for our purpose. And in view of this unsettled opinion among the authorities, it is incumbent upon each one of us to endeavor to lay down for himself some broad principles, that we can apply in the treatment of individual cases. In searching for such a guide we have to remember, first, that convulsions ensue only in a limited proportion of the cases where albumen is present.

\**Obstetrical Journal of Great Britain and Ireland*, August, 1876, p. 292.

†*Loco citato*, p. 184.

‡*System of Midwifery*, 2nd Am. Edition, p. 683.

Blot, in 205 cases of pregnancy, found albumen in the urine in 41, only 7 of whom had convulsions. Litzman, in 131 cases, met with 37 instances of albuminuria with 12 cases of eclampsia. We are not, therefore, justified primarily in assuming that any given case, even if left to itself, will of necessity terminate in such an explosion. Indeed, I suspect, from my own experience, coupled with the best attention I have been able to give to the general study of this subject, that the chances of convulsions in albuminuria are much smaller than one would infer from the figures just given. I think I am entirely within bounds when I express the opinion that there are at least ten cases of albuminuria for every one of convulsions. Now add to this probability of immunity from the dangerous complication alluded to, the almost positive certainty that we can, in the majority of cases, ameliorate the symptoms by the plan of treatment already considered, and it is evident enough that it would be bad practice to at once institute the line of treatment indicated under this head.

Secondly, we must remember, also, that the degree of danger is not necessarily in a fixed ratio to the amount of albumen found in the urine, and it would therefore be unwise to base the induction of premature labor on this factor alone. The case must be studied in its totality, and the urgency of the symptoms is a better guide than the mere amount of albumen.

Thirdly, it must not be forgotten that delivery does not of necessity cure the albuminuria and prevent convulsion. On the contrary, there can be no doubt, as stated by Macdonald, that at times it introduces a new element of danger; because the mere pains of labor, *i. e.*, the contractions of the uterus, furnish "a new source of reflex irritation." Common sense and prudence, therefore, would suggest that we reduce this irritation to a minimum and cure if possible the morbid process by appropriate treatment, rather than add fresh fuel to a flame, which may burst into a conflagration, that will utterly destroy all our chances of safety.

Fourthly, time or the duration of the disease is an important item for consideration. When taken early, most cases will respond to appropriate treatment; and even in long-neglected cases, where the existence of albuminuria has not been detected until the gravity of the constitutional symptoms has compelled medical attention, it is astonishing how effective treatment oftentimes may prove; and so I can hardly conceive of a case—except the patient were already in a moribund condition—in which the best practice would not be to attempt

to meet the first three indications of treatment, and if the case does not respond to this, *then* put in practice the fourth indication.

If I were, then, to formulate any rule of treatment, it would not differ materially from that laid down by Playfair and Barker, both of whom, it will be remembered, restrict the operation to cases *where treatment has been thoroughly tried*, but has failed to secure any amelioration of the symptoms. This rule I conceive to be a safe one in practice, and in the majority of instances it will be more satisfactory than the opposite one of indiscriminate resort to induction of labor in all cases. It is beyond the province of this paper to describe the different methods of enforcing this last indication. They are known to you all. Those methods, however, which give the largest hope of a speedy result compatible with as small a degree of irritation of the maternal tissues as is possible, should receive the preference. I purposely omit, also, a discussion of the propriety of doing the operation in the child's interests alone, for not only on general principles of morality but especially by reason of the well known fact that albuminuria not only brings the child into excessive danger, but usually destroys it, the question of saving it must, in the nature of the case, assume a secondary importance.

I cannot close this paper without again expressing the belief that medical art now furnishes a certain method of averting, in very many if not the large majority of cases, the dangers consequent upon the albuminuria of pregnancy, and that it should be our constant aim to early recognize the condition, so that the treatment may be applied in season. If we can ever arrive at a unity of belief regarding the pathogenesis of this condition, or disease, if we choose to call it such, and a fixity of practice concerning its treatment, it can only be by the general dissemination among the profession of what is already known concerning it, and by the careful collection, description and comparison of cases and by experimentation upon them. Every one, no matter what his position in the profession, can do something in this direction, and my time will not have been spent in vain, if I shall have induced any one of you to make public the results of his experience, or if what I have written may be of any service to you in practice.











